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Joint Ill in Lambs.

Preliminary Investigation.

By R. L. Cornell, B.Sc., M.R.C.V.S., and
R. E. Glover, B.Sc, M.R.C.V.S.
(Institute of Animal Pathology, Cambridge).

During the past ten years considerable progress has been made in the elucidation of the problems of polyarthritis in foals. Thanks to the investigations of M'Fadyean and Edwards (1) in this country, and of Magnusson (2) in Sweden, our knowledge of the organisms which may set up this disease has been materially advanced.

It is not within the province of this article to discuss the findings of different investigators in connection with joint ill in foals. An extensive review of the subject will be found in the articles of the above authors. Nevertheless, it may not be out of place to consider the conclusions of these writers concerning the etiology of the condition.

M'Fadyean and Edwards, as a result of their researches, consider that the majority of cases are due to a streptococcal infection. They also recognise *B. nephritidis equi* to be a not infrequent causal organism, while bacteria of the colon type and *B. abortivo equinus* are occasionally encountered.

The figures obtained by Magnusson support these conclusions, although his percentage of streptococcal infections is lower. However, he specifically states that, owing to the fact that streptococci are mostly met with in the larger foals, which on account of expense were not sent to his laboratory, the percentage of these cases should in all probability be higher. His figures are as follows:—

Streptococci	...	36.9 per cent.
Diplococci	...	36.9 per cent.
B. nephritidis equi	...	30.9 per cent.
B. coli ...	...	27.1 per cent.
Miscellaneous	...	5.1 per cent.

These authors consider that the uncicatrised umbilicus is the common path of entry and emphasise the importance of efficient disinfection of the navel as a prophylactic measure.

In view of the extensive investigations which have been devoted to this subject, it is somewhat surprising that a similar condition occurring in lambs appears to have received little attention. Granted that the clinical aspect has been well described in some text books, together with suggested lines of preventive measures and of treatment, no serious attempt appears to have been made to determine the various organisms that are capable of setting up the disease under natural circumstances. This knowledge can only be obtained by studying material from a long series of outbreaks in many localities. The present paper deals only with such information as we have been able to obtain during the past lambing season.

Part 1.—Streptococci.

Except in the case of one outbreak, which showed certain pecularities and which is described in the second part of this article, the only organisms which we have so far encountered in outbreaks of joint ill in lambs is a streptococcus.

The disease is apparently very irregular in its incidence. In some flocks it is common to find that a few isolated cases have occurred for several years past and then, under identical conditions of flock management, an extensive outbreak may follow. In other cases equally serious losses may be experienced without apparent reason in flocks in which the disease has been unknown for a number of years, and it is remarkable that it may again disappear entirely at the next lambing season. Some owners have noticed that the disease regularly appears on certain fields or parts of fields, even though such may have been free of sheep for a prolonged period. It must be admitted that no satisfactory explanation of the source of infection can at present be put forward.

Since the umbilicus is generally considered to be the point of entry of the causal organisms of joint ill in foals, we have paid special attention to this site as the probable primary focus of the infection in the lamb. That this is not invariably the case is indicated by the fact that in one outbreak there was no evidence of umbilical infection in any of the lambs examined and, moreover, observations pointed to another channel of infection.

Material which we have examined has been derived for the most part from outbreaks of joint ill among flocks in the Eastern Counties. The clinical manifestations and the extent of the lesions, however, vary somewhat in the different flocks, and details will be given for each.

Outbreak 1. This occurred in a Suffolk flock. Lambing took place in freshly made straw pens, and the ewes and lambs were folded on turnips as soon as possible. Over a hundred lambs were affected. They showed symptoms from one to three weeks after birth. The disease was essentially chronic in its course and death only took place after a week or more.

The first symptom noticed was lameness, which often occurred before any abnormality of the joints could be detected by palpation. This was soon followed by swelling of the joints, which became hot, painful, and fluctuating. In many cases these swellings burst spontaneously, discharging a yellowish-white pus containing small flocculi. In a few cases abscesses were present at the umbilicus, but more fre-

quently there was little apparent alteration in this region, except that the cord felt slightly thickened.

Four affected lambs were killed by chloroform and examined the same day.

Lamb 1.—The joints affected were a hock and a stifle. The latter was very swollen and after reflecting the skin it was seen that the abscess formation involved not only the joint but also the periarticular tissue and the tendon sheaths. The umbilicus appeared slightly thickened, but showed no evidence of suppuration. All the internal organs appeared normal. Smears from the joint lesions showed large numbers of streptococci and leucocytes. Streptococci were also seen in smears of blood clot from the umbilical vessels.

Streptococci were obtained in pure culture from the hock, stifle, heart blood and umbilical vessels.

Lamb 2.—This animal showed an abscess affecting the right fore fetlock involving the joint cavity, and an abscess at the hock on the opposite side. A pure culture of a streptococcus was obtained from the pus from both joints. Heart blood and umbilical clot were not cultured.

Lamb 3.—The hock was affected and the navel showed some thickening without suppuration. Streptococci were obtained from the hock, umbilical vein and heart blood.

Lamb 4.—In this lamb the elbow was extensively involved and several abscess cavities existed between the muscles around the joint. A fetlock was also affected. Streptococci in pure culture were obtained from both joints. The umbilicus was thickened, moist, and commencing to suppurate. Cultures from the clot of the umbilical artery were overgrown by a white staphylococcus and a streptococcus was not isolated.

In the above-mentioned cases the cultures from the umbilicus were obtained by opening up the abdomen with sterile precautions, snipping off about half an inch of the umbilical artery or vein with sterile instruments and dropping this into serum glucose broth. It is interesting to note that in two cases (lambs 1 and 3) a good growth was obtained from the heart blood, although the lambs appeared quite bright and would, no doubt, have lived for a considerable time under natural circumstances.

Outbreak 2. The history of this outbreak was similar in all its main points to that of the preceding. The ewes lambed in freshly-constructed pens adjacent to a field of roots on which the ewes and lambs were placed as soon as possible. The number of losses was not accurately ascertained, as a proportion of ewes had not lambed at the time the flock was visited. At least forty lambs were then affected. Three cases —one dead and two alive—were obtained for examination.

Lamb 1 (*dead*).—There was an abscess at the hock and the navel appeared to be thickened. Streptococci were obtained from the hock and umbilical artery.

Lamb 2 (*alive*).—A fetlock joint was infected and the stifle was very swollen from periarticular abscesses. Streptococci were obtained in pure culture from both joints. Cultures from the precrural gland of the same side as the affected stifle remained sterile and no growth was obtained from the heart blood or umbilical vessels.

Lamb 3 (*alive*).—The right stifle was the only joint affected. On opening the lamb, however, an abscess in the umbilical artery near the abdominal wall was encountered. A streptococcus and a small gram-positive bacillus were obtained from the pus of this abscess. Cultures from the affected stifle yielded a pure growth of streptococci. The right precrural gland and the heart blood were sterile.

Outbreak 3. This flock was composed of about 200 ewes and it was estimated that 75 lambs died of joint ill. There was no history of any serious outbreaks of the disease on the farm during the preceding years, although sporadic cases had been noted from time to time.

During the autumn of 1924, a peculiar condition was encountered amongst the ewes. In the shearlings fluctuating swellings appeared over the eyes, the nostrils, and the mouth. In some these swellings persisted for several days and then gradually subsided. In others, abscess formation occurred with the discharge of a thick yellowish pus. Similar lesions appeared around the coronets and on the skin of the legs. In the ewes the lesions were mostly confined to the legs and to the feet. As no investigation was made into this condition among the ewes, it was not possible to determine whether there was any correlation between it and the subsequent outbreak of polyarthritis among the lambs.

Turning to the outbreak among the lambs, the majority of these showed signs of joint ill within two to four days of birth. Some lambs were visibly ill when born and showed swellings of the joints within a few hours. A marked feature was the rapid onset of symptoms, followed, in most cases, by a fatal termination within forty-eight hours. In a few, however, the disease assumed a more chronic form. The enlargement of the joints developed less rapidly and death was delayed in some cases up to a fortnight. Only a very small percentage recovered.

In the early stages the swellings around the joints were the most marked feature of the affection. They were formed with great rapidity, were hot, tender, and fluctuating, and in the more chronic cases showed a tendency to rupture, forming open joints. The swellings were not confined to the region of the joints. Frequently a well-marked hæmorrhagic œdema of the tendon sheaths and subcutaneous tissues extending from the stifle or elbow to the fetlock was produced, the lesions bearing a marked resemblance to an extensive bruise. In some cases similar œdematous swellings were noted over the eyes and on the cheeks. Special note was taken of the condition of the umbilicus in all affected lambs, but in no case was it possible to discover evidence of an infection by this channel.

After parturition many of the ewes were subject to a chronic metritis lasting from two to four weeks.

Such ewes showed a marked loss of condition and a few died within a week of lambing.

Lamb 1.—This animal had shown swellings of the joints for two days. It was killed when at the point of death, and a *post-mortem* examination made immediately. The stifle, hock, and fetlock joints of both hind limbs were much enlarged. The skin over the front of the left hock joint was denuded of hairs, and in the centre of this area there was an opening communicating with the hock joint, from which a thick, slightly blood-tinged, yellowish fluid was exuding. A well-marked hæmorrhagic œdema of the tendon sheaths and subcutaneous tissue extended from the stifles to the fetlocks. The left elbow and knee joints were also enlarged. These articular cavities contained a viscous yellowish-white fluid with flecks of fibrin. The quantity of fluid in a joint might amount to 2.0 c.c.

The umbilicus was dry and normal in appearance, and the umbilical vessels showed no evidence of disease. Apart from some slight congestion of the liver and mesenteric glands, no abnormal changes could be detected in the organs.

Smears from affected joints revealed the presence of numerous short-chained streptococci with an occasional leucocyte.

Cultures were made on serum agar slopes from heart blood, liver, right hock, stifle and œdematous swelling of the leg. From the heart blood and liver about a dozen pin-point transparent colonies were obtained. The other sites yielded a pure, very abundant growth of the same type of colony. The organism obtained in culture proved to be a streptococcus.

Lamb 2.—This lamb had been showing symptoms for three days. When seen it was at the point of death and succumbed while being transported to the laboratory.

The *post-mortem* examination revealed the following changes. The left stifle and hock, and the right hock joints were greatly enlarged and fluctuating. A well-marked œdema of the tendon sheaths extended from the hocks to the fetlocks. The joints contained a slightly blood-tinged, viscid, yellowish-white fluid, and the articular cartilages were markedly reddened. The liver, spleen and mesenteric glands showed slight congestion. No lesions could be found which might have indicated that infection had occurred by way of the umbilicus.

Smears from the exudate in the joints revealed numerous streptococci. Culture made on serum agar from the heart blood and spleen yielded a pure, scanty growth of a streptococcus, about twenty colonies appearing from each site.

Cultures were made from three more lambs which were killed when in the last stages of the disease. Since the *post-mortem* findings were almost identical with those obtained in the previous lambs, details will not be given. Streptococci were obtained in pure culture from the affected joints and in scanty numbers from the heart blood.

		Lactose.	Glucose.	Maltose.	Lævulose.	Mannite.	Saccharose.	Dulcite.	Insulin.	Salacin.	Arabinose.	Glycerin.	Litmus Milk.	Gelatin.	Blood Agar.
		Acid. Gas.	Acid. Gas.	Acid. Gas.	Acid. Gas.	Acid. Gas.	Acid. Gas.	Acid. Gas.	Acid. Gas.	Acid. Gas.	Acid. Gas.	Acid. Gas.			
Outbreak 1.	Hock L.1.	−	+	+	+	−	+	−	−	−	‡	−	Bleach Alk. A.	No liquefaction	H.
	Heart Blood L.1. ...	−	+	+	+	−	+	−	−	−	+	−	Bleach Alk. A.	No liquefaction	H.
	Clot Umbilical Artery L.1.	−	+	+	+	−	+	−	−	−	‡	−	Bleach Alk. A.	No liquefaction	H.
	Fetlock L.3.	−	+	+	+	−	+	−	−	−	‡	−	Bleach Alk. A.	No liquefaction	H.
	Hock L.3.	−	+	+	+	−	+	−	−	−	‡	−	Bleach Alk. A.	No liquefaction	H.
	Elbow L.4.	−	+	+	+	−	+	−	−	−	+	−	Bleach Alk. A.	No liquefaction	H.
Outbreak 2.	Hock L.1	−	+	+	+	−	+	−	−	−	+	−	Bleach Alk. A.	No liquefaction	H.
	Stifle L.2	−	+	+	+	−	+	−	−	−	+	−	Bleach Alk. A.	No liquefaction	H.
Outbreak 3.	Hock L.1	−	+	+	+	−	+	−	−	−	‡	−	Bleach Alk. A.	No liquefaction	H.
	Uterus Ewe	−	−	−	+	−	+	−	−	−	‡	−	Bleach Alk. A.	No liquefaction	H.
*Outbreak 4	... ...	−	+	+	+	−	+	−	−	−	‡	−	Bleach Alk. A.	No liquefaction	H.

\+ = Acid.
‡ = Slight acid.
− = No change.
• = Outbreak 4 is not described in the article.

Bleach = Bleaching of litmus milk.
Alk. A. = Slight alkalinity at 48 hours, followed by acidification.
H. = Hæmolysis.

The uterus of a ewe which died a few days after lambing and whose lamb had developed joint ill, was obtained for examination. Immediately after death, the neck of the uterus was ligatured and the whole organ excised. It arrived at the laboratory in a fresh condition. The body and both horns contained a quantity of a viscous chocolate-coloured exudate, and the mucous membrane was distinctly œdematous and hæmorrhagic. Smears from the exudate revealed numerous gram-positive diplococci and streptococci. Cultures were made on serum agar slopes and an abundant, nearly pure growth of a streptococcus was obtained.

In so far as can be ascertained, the strains obtained from these outbreaks all appear to conform to one type. In lesions and in culture they assume the form of short chains of small gram-positive cocci. On serum agar, after twenty-four hours' incubation, small translucent colonies appear which, with further inoculation, may increase in size up to 1 to 2 m.m. diameter. All the strains studied are hæmolytic and do not liquify gelatin.

The preceding table is given in order to show the reactions on the sugars of strains from the various outbreaks. Attention is drawn to Outbreak 3, in which the streptococcus isolated from the lambs, fermented the same sugars as that recovered from the uterus of one of the ewes.

Outbreak No. 4 is not described in this article as, although many of the lambs had developed polyarthritis, the mortality was not high and the only material obtained for examination was a swab from the umbilicus of an affected lamb. However, a pure culture of a streptococcus was isolated and this strain gave similar reactions to the other strains.

Part II.—Bacillus of Swine Erysipelas.

Of recent years it has been recognised that infections with the bacillus of swine erysipelas are not confined to the pig. This organism is capable of establishing itself in the bird, and is responsible for occasional serious outbreaks amongst fowls, ducks, pigeons, etc.

The disease can assume both an acute and a chronic form. As an example of the former one may cite the findings of Schipp (3) and of Jarosch (4) who isolated this organism from fowls and guinea-fowls respectively which died from a septicæmia.

Pfaff (5) observed a chronic infectious disease amongst fowls which he ascribed to this bacillus. The symptoms lasted over a period of from two to five weeks and the birds invariably succumbed. *Post-mortem* examinations revealed diphtheritic exudates in the cæca and small areas of necrosis in the liver. An organism indistinguishable from the bacillus of swine erysipelas was isolated from the lesions.

It appears to be certain that a similar condition is occasionally encountered in domesticated animals other than the pig. In a recent review of the subject, Panisset and Verge (6) have summarised the findings of several investigators and point out that on rare occasions localised epizootics among cattle and sheep have been due to an infection with this organism.

In 1913, Pœls (7) described an outbreak of polyarthritis among a flock of sheep. The chief symptoms which he noted were progressive emaciation, thickening of the epiphises of the bones, with erosion of the articular surfaces and the presence of an exudate in the joint cavities. At a later date, his findings were confirmed by Ostertag and by Wall, in outbreaks of a similar nature.

In 1919, Christiansen (8) encountered a different form of disease due to this organism in a flock of young lambs among which there had been a high mortality. A *post-mortem* examination of one of these lambs showed a hæmorrhagic enteritis, great enlargement of the mesenteric glands, degenerative changes of the organs, and hæmorrhages under the endocardium and epicardium. There was no history of a case of erysipelas amongst the pigs on the farm at the time of the outbreak amongst the lambs.

It would appear, therefore, that under certain conditions the bacillus of swine erysipelas is capable of establishing itself in the sheep and the lamb and, as in the case of the pig, of setting up:—

1. An acute form of the disease, whch is generally fatal in from twenty-four hours to a few days after the onset of the symptoms, or,
2. A chronic form in which the organism shows a predilection for certain seats, the joints in particular.

However, in view of the widespread incidence of erysipelas amongst swine in this and other countries, and taking into consideration the known ability of the organism to maintain a saprophytic existence over long periods, it is probable that ruminants are not readily susceptible to infection.

The outbreak which is under consideration occurred amongst a flock of Dorset Horn lambs. At the previous lambing period the owner had noticed that a few of the lambs had developed swellings around the joints, but the actual mortality was not greater than was ordinarily experienced, and no particular note was taken of the condition. During the past season, in a flock of 250 ewes, about 40 lambs succumbed to the disease, and at least double this number developed the chronic form with arthritis of many joints. Such lambs were stunted in appearance and remained unthrifty over a long period. It may be noted in passing that the owner was not in possession of any pigs, nor was he aware of an outbreak of erysipelas amongst the pigs in the immediate neighbourhood. The lambs appeared to be healthy when born and no symptoms of disease were observed before the fourteenth day. Some, indeed, were not visibly affected until they reached the age of one month. In the acute cases symptoms developed with great rapidity. A slight depression and stiffness of gait was followed in a few hours by swelling of the joints, with marked lameness and obvious signs of septicæmia, Death occurred within thirty-six to forty-eight hours of the onset of symptoms. In others the disease ran a more protracted course. The early symptoms were less marked than in the rapidly fatal cases. The joint lesions developed more slowly, and the

swellings rarely attained the size of those seen in the acute cases. A peculiar feature was the formation of subcutaneous abscesses which, in the first place, commenced in the neighbourhood of the joints and then appeared to spread along the ventral wall of the abdomen. Some such cases made a partial recovery, but many became progressively weaker and died about the tenth to fourteenth day.

Post-mortem examination of several lambs which had either just succumbed or had been killed in the last stages of the disease revealed certain changes which were characteristic. The pericardial sac always contained an excess of clear, serous, citron-coloured fluid. Beneath the epicardium the heart-muscle showed well-marked ecchymoses. There was no very evident increase in size of the spleen even in acute cases. In the kidney the boundary layer was invariably congested and the cortex abnormally friable. The presence of numerous abscesses, varying in size from a pin's head to a lentil, was noted in the kidneys of two lambs whch were affected with the chronic form. No evidence could be found of an infection by way of the umbilical vessels. The joints which appeared to be the most frequently attacked were the elbow, knee, stifle and hock. In acute cases, in addition to an œdema of the periarticular tissue, the articular cavities contained a quantity of a cloudy somewhat viscous, yellowish-white fluid. In the more chronic form the œdema around the joints was less marked, and here the increase in thickness was partially due to the formation of inflammatory connective tissue. The joint cavities contained no excess of fluid, but the articular surfaces were covered by a thin diphtheritic deposit. Occasionally, definite areas of erosion were observed in the articular cartilage. The subcutaneous abscesses were found to contain a thick, slightly green-tinged pus. Their formation and distribution suggested a spread of infection from the joint lesions by way of the lymphatic vessels.

From the heart blood, spleen, kidney, articular cavities and subcutaneous abscesses a slender gram-positive bacillus with pointed extremities was obtained in pure culture. On the surface of serum agar slopes, after 24-48 hours incubation, numerous pin-point transparent colonies appeared. It was remarkable that even in chronic cases which were destroyed several hours before the estimated time of death, four to six drops of heart blood yielded from fifty to one hundred colonies.

From a study of the morphological and cultural characteristics, this organism appeared to be identical with the *Bacillus erysipelatis suis*. Stab cultures in gelatine gave the typical bottle brush growth associated with this bacillus. The organism produced acid, but not gas, in lactose, glucose, maltose, lævulose; slight acid in insulin; no change in saccharose, mannite, dulcite, salicin, arabinose, and glycerine. There was slight acidification of litmus milk without clot. A strain of erysipelas derived from pigs was tested at the same time, and gave exactly similar sugar reactions.

The bacillus isolated from the lambs was agglutinated by a potent anti-swine erysipelas serum, though not in so high a dilution as a strain of porcine origin. This is illustrated in the following table.

TABLE 1.

Serum Anti-Swine Erysipelas.	Emulsion Porcine Strain S.E.	Emulsion Lamb Strain S.E.
1·500	+ + + +	+ + + +
1·1000	+ + + +	+ + +
1·2000	+ + +	+
1·5000	+	—
1·10000	—	—
1·20000	—	—
Neg. Horse Serum		
1·50	—	—
1·100	—	—

+ + + + = Complete agglutination.
+ + + = Nearly complete agglutination.
+ = Appreciable agglutination.
— = No agglutination.

The pathogenicity of the organism isolated from the lambs will now be discussed. In order to avoid unnecessary repetition, the abbreviation (S. E. L.) will be used to designate the strain obtained from the lamb, and (S.E.P.) will represent an authentic strain from the pig.

All inoculations were made with 24 hour broth cultures.

Table 2 shows that the two strains S.E.L. and S.E.P. were equally pathogenic for mice and that a good anti-swine erysipelas serum was capable of affording protection against both cultures.

TABLE 2.

Mouse.	Anti S.E. Serum Intra-peritoneal.	Culture S.E.L. Intra-peritoneal.	Result.
1	0·3	0·000005	Survived.
2	0·3	0·00001	Ditto.
3	0·3	0·00005	Ditto.
4	0·3	0·0001	Ditto.
Control.			
1	No serum.	0·0000005	Survived.
2	Ditto.	0·000001	Died 5 days later.
3	Ditto.	0·000005	Ditto.
4	Ditto.	0·00001	Ditto.

Mouse.	Anti S.E. Serum.	Culture S.E.P.	Result.
1	0·3	0·000005	Survived.
2	0·3	0·00001	Ditto.
3	0·3	0·00005	Ditto.
4	0·3	0·0001	Ditto.
Control.			
1	No serum.	0·0000005	Survived.
2	Ditto.	0·000001	Died 5 days later.
3	Ditto.	0·000005	Died 4 days later.
4	Ditto.	0·00001	Ditto.

Strain S.E.L. proved fatal to pigeons by intramuscular inoculation, but differed markedly from the porcine strain in that it was almost avirulent to rabbits by intravenous inoculation even in a dose of 3 c.c.

Experiments on Lambs.

Lamb 1.—On the morning of the 21st February, 1925, a ram lamb, aged five days, was inoculated subcutaneously with 1.c.c. of S.E.L. The following morning the lamb was distinctly depressed and refused to feed. The point of inoculation was slightly tender but no swelling was apparent. It was found dead late in the afternoon of the same day. The *post-mortem* examination, which was made immediately, revealed a slight hæmorrhagic infiltration of the tissues at the point of inoculation. The peritoneal cavity contained a slight excess of clear pale-yellow serous fluid. The liver, kidneys and abdominal lymphatic glands were markedly congested. The organism was recovered in pure culture from the local lesion, heart blood and peritoneal cavity.

Lamb 2.—On 24th February, 1925, a ram lamb, aged four days, was inoculated subcutaneously into the abdominal wall with 0.5 c.c. of S.E.L. The symptoms which followed much resembled those seen in the previous lamb. The animal was found dead about the 48th hour. The organism was recovered from the heart blood and from the spleen.

Lamb 3.—On 16th May, 1925, a seven-day-old lamb was inoculated subcutaneously with 1 c.c. of S.E.P. No reaction could be detected in this lamb. A transient tenderness was noticed at the point of inoculation. Otherwise the animal remained perfectly healthy. A pig inoculated with this strain a few days previously had developed erysipelas in an acute form.

Lamb 4.—On 24th February, 1925, a lamb two weeks' of age, was fed with 2.0 c.c. of S.E.L., suspended in 10 c.c. of ewes milk. On the 9th March, 1925, the mother ewe died and the lamb was subsequently reared on cow's milk. The lamb at no time showed any evidence of infection of the joints, and remained perfectly healthy throughout the experiment.

Lamb 5.—On 9th June, 1925, a lamb, about three weeks' of age, was fed with 10 c.c. of S.E.L. This dose was repeated on the following dates:—10th June, 1925, 11th June, 1925, 18th June, 1925, 29th June, 1925, 1st July, 1925. Three days after the third feeding the lamb appeared dull and refused to feed. This depression lasted for three days and was followed by an acute lameness in both hind legs with swelling of the hock joints. The lameness persisted until the animal was killed on the 31st July, 1925. On *post-mortem* examination the organs appeared to be normal. Cultures made from the heart blood, spleen and kidney remained sterile. Changes had occurred, however, in both hock joints and in the near stifle. The periarticular connective tissue was moderately thickened. The articular surfaces of the affected joints were covered by a slight fibrinous deposit, and three small areas of erosion were noted on the articular surfaces of the tibia and the astragalus. Cultures on serum agar which were made from these joints yielded a few colonies of the organism. About twenty colonies were obtained from the amount of fibrinous deposit, which could be scraped off with a platinum loop.

Lamb 6.—Commencing on the 9th June, 1925, this lamb, which was fellow to the preceding, was fed in a similar manner on the same dates. About ten days after the initial dose it developed a slight lameness in one hind limb, which disappeared a week later. The lamb was destroyed on the 3rd August, 1925. No abnormalities could be detected in the organs and in the joints, and cultures made from heart blood, spleen, and joints remained sterile.

Lambs 7 *and* 8.—Commencing on 9th June, 1925, a similar feeding experiment was run concurrently with the preceding, using a culture of S.E.P. The two lambs remained quite healthy and the joints were not involved.

Pig.—On 14th March, 1925, a four months' old pig was inoculated intravenously with 3.0 c.c. of S.E.L. The pig did not develop swine erysipelas and appeared to be in normal health six weeks later.

Summary.

A condition of joint ill in lambs bearing a marked resemblance to the corresponding disease in foals appears to be the cause of considerable losses to the flocks of this country. There is evidence to show that extensive outbreaks of a polyarthritis are not infrequently due to a streptococcus unaccompanied by any other organism.

In some outbreaks all indications point to the umbilicus as being the point of entry of the causal organism. In one outbreak, however, no such evidence could be obtained, and the observable facts were such that the possibility of intra-uterine infection could not be excluded.

The bacillus of swine erysipelas proved to be the cause of one outbreak, but it is probable that this will be found to be only an occasional factor in the etiology of this condition. In view of the efficiacy of serum in the prevention and treatment of swine erysipelas in pigs, it is reasonable to assume that it would be of value in the control of this condition in lambs.

It is probable that, with further study, organisms other than the two which have been described will be found to be a cause of joint ill in lambs.

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Lathyrism.

By G. W. Clough, D.Sc., Royal Veterinary College, London.

It is now well established that some foods produce chronic diseases owing to the presence therein of small amounts of some poisonous substances, whilst other diseases may be caused by a deficiency of some essential materials in the diet. Ergotism is a typical example of the former class of diseases; the latter class may be exemplified by beri beri, which is caused by a diet lacking one of the vitamines. The balance of evidence at the present time indicates that lathyrism is the result of the consumption of certain foods containing a toxic substance.

Lathyrism has been frequently encountered in man in India and in countries bordering on the Mediterranean; moreover, many records of the disease, especially in the horse, are to be found in English and foreign veterinary literature. Kobert (*Lehrbuch der Intoxikationen*) states that "by lathyrism we mean an intoxication that was known to the contemporaries of Hippocrates and which is caused by the seeds of at least three species of vetch—*Lathyrus hirsutus*, *Lathyrus sativus* and *Lathyrus clymenum*." It is interesting to note that such serious results followed the use of meal from some species of vetch that the Duke of Wurtemburg issued an edict in 1671 forbidding its use. The commonest form of *Lathyrus sativus* is the chickling vetch, the seed of which is known as the grass pea or "khesári" (Bengal). This pulse has at times been imported into this country under the name of "Mutter Pea," but strictly the true "Mutter Pea" of India is *Pisum arvense*, the grey or field pea, a harmless feeding stuff. The Riga pea or dog-tooth pea (a large white variety) is another form of *L. sativus* (*Kew Bulletin*, Nos. 1, 2, 1919, p. 9).

Large quantities of Indian peas are imported into England as food for horses and cattle. The designation "Indian Peas" is used in the corn trade for a mixture of *Pisum sativum* (ordinary pea) and *Pisum arvense*, and by custom about 15 per cent. of *L. sativus* is allowed. But it is not uncommon for the amount of the latter to reach from 20 to 30 per cent. Messrs. Ralli Bros., had 4,800 tons of Indian peas during 1912 and it was considered that 13 per cent. of *L. sativus* was a moderate proportion (Holmes, *Pharm. Journ.*, 1913, 36, 795). From time to time consignments of Indian peas have been found to consist almost entirely of the seeds of *L. sativus*.

Some idea of the damage which has been caused by lathyrism in this country may be obtained by reference to the literature, but there can be little doubt that in the early days there were cases of lathyrism incorrectly diagnosed, since symptoms frequently do not appear for weeks after feeding on the pulse. In a classical paper Leather described his investigation of an outbreak at Liverpool; out of 74 cart horses, 35 were affected, and of these 19 died. These horses had been given about three pounds of "Indian Mutters," which were seeds of *L. sativus*, per day (*Veterinarian*, 1885, 233). McCall investigated cases in Scotland, including an outbreak in Glasgow, where twelve horses died. Fatal results even occurred when only half a pound of "Indian Pea Meal" per day was fed (*Veterinarian*, 1886, 789; 1890, 495). In 1893 the Bristol Tramways and Carriage Co. bought some Indian peas; these peas were found afterwards to consist mainly of the seeds of *L. sativus*, for out of 335 peas no fewer than 325 were the seeds of *Lathyrus*. Twelve horses died out of 127 which were affected. These horses had been fed with two pounds of the peas and 28 pounds of other food per day (Bristol Tramways and Carriage Co. *v.* Weston and Co., *Times*, July 17th, 1894. Bayne, *Veterinarian*, 1894, 450, 531, 624). In 1896 twelve horses died at the Hamstead Colliery, and others were permanently injured; the Great Western Railway Company lost 24 horses from the disease (*Vet. Journ.*, 1896, 77, 154) and there were casualties at Lincoln in 1913 (*Lincolnshire Echo*, 1913, May 20th). Abson recorded two outbreaks at Sheffield in 1894; the horses had been given about four pounds of "Riga Peas" per day, but the symptoms were quite similar to those caused by "khesári." Abson states that he was at first inclined to associate the malady with lead poisoning (*Veterinarian*, 1894, 754).

In 1924 the malady appeared on a farm in Norfolk. Mr. S. E. Hill, M.R.C.V.S., and Professor Macqueen diagnosed the case as one of lathyrism. In view of Abson's statement (*supra*) the present writer tested the viscera of one horse for common poisons, especially lead, but none was detected. The food was a mixture of flaked maize and crushed *L. sativus*; I estimated the amount of the latter to be about 40 per cent. by weight. Fortunately some of the unsplit peas were obtained and these consisted almost solely of *L. sativus*; in one ounce (about 400 peas) I only found about half a dozen other seeds, probably weeds. The foreign journals contain similar records of epidemics and also accounts of damage to cattle after feeding on *L. clymenum*. It is of especial interest to note that peas of *L. sativus* and *L. cicera* were used by the French army to supplement the corn feed for horses during the war; a serious outbreak of lathyrism occurred among horses at Grenoble, where 16 died (Mirande, *Comptes Rendus*, 1921, 172, 18). (For other references to veterinary literature, see Kärnbach and Habersang, *Monatshefte fur prakt. Tierheilk.*, 1914, 25, 302.)

It is not necessary to describe the characteristic symptoms here, as they are adequately given in the

(*Continued from previous page.*)

6. Panisset et Verge. La presence du bacille du rouget et de bacilles semblables chezles autres espèces animals que le porc. *Rev. Gen. de Med. Veterinaire*, 1922. Vol. 31, p. 317.

7. Poels. Polyarthritis beim Shafe, verursacht durch den Rotlaufbazillus der Schweine. *Folia Microbiologia*. 2 jahrg.

8. Christiansen. Om Rodoyge Infection nos forskellige Husdyr Specielt nos Paar og Lam. *Maanedskrift for Dyrloeger*. Vol. 31.

standard works (Lander, *Veterinary Toxicology*; Long, *Plants Poisonous to Live Stock*, 1924, p. 29). The present writer desires especially in this report to draw attention to the present state of knowledge concerning the cause of the toxic action of *L. sativus*. In 1885 Leather ascribed the disease to the presence of a poison in the pea, but Williams suggested that the malady was due to bacilli in the dust or dirt surrounding the pea. McCall's investigations proved that the latter hypothesis was untenable and McCall assumed that the peas contained a poisonous substance. Teilleux reported that he found a resin acid which induced typical effects on rabbits, whilst Bourlier separated an alkaloid by extracting the seeds with alcohol and ether, and poisoned birds with it. Louis Astier claimed to have isolated a volatile alkaloid. Stockman succeeded in extracting minute quantities of a poisonous alkaloid which caused symptoms of paralysis in monkeys (*Ed. Med. Journ.*, New Series, xix., 277, 297). Lander (1912) states that "it is not impossible that further research may show that we have to deal with toxine poisoning like that of the castor bean, or it may possibly be found that *lathyrus* lacks certain essential componets whose absence leads to disease, as has been shown to be the case with polished rice." Kobert stated that nothing certain as to the poisonous properties of the vetch was known, as attempts to isolate the poison had failed. Kärnbach and Habersang (*loc. cit.*) have isolated a poisonous body of alkaloidal character by extracting *Lathyrus* seeds with water containing sulphurous acid and with alcohol containing hydrochloric acid; they state that this exerts a specific action (similar to that of *Lathyrus*) on the nervus vagus. The seeds of several forms of *L. sativus* from India, Cyprus and Ceylon have been extracted at the Imperial Institute with the view of isolating a toxic constituent, but the results have been of a negative character (*Bulletin of the Imperial Institute*, No. 4, 1917, p. 531). Similarly at the Research Institute at Pusa no alkaloids were detected in *L. sativus*, but during the course of the work it was noticed that samples of "khesári" often contain seeds of *Vicia sativa* ("akta") and *Vicia hirsuta* from which a cyanogenetic glucoside was isolated (1915). Mirande (1921) suggests that the poisoning is due to the production of sulphuretted hydrogen, which exerts a severely poisonous action inducing asphyxia.

It can hardly be said that the above conflicting statements lessen the obscurity which has long existed regarding the toxic action of *Lathyrus*. The results of an investigation by Anderson, Howard and Simonsen, published this year, simultaneously throw light and shadow on the whole subject (*Indian Journ. Med. Research*, 1925, 12, 613). Chemical analysis and feeding experiments with ducks and monkeys have shown that botanically pure seeds of *L. sativus* ("khesári") contain no alkaloids and are non-toxic; the seeds indeed furnish a nourishing food for these animals. The authors were aware that *L. sativus* is seldom grown in pure cultures, but is usually contaminated with various weeds. The seeds of *Vicia sativa* ("akta") were present in every specimen of "khesári" obtained from districts where lathyrism is common. Now chemical analysis has fully confirmed the results of previous investigators, that at least two glucosides are present in "akta"; one is vicianin, which is closely allied to amygdalin; the other is vicine, which on hydrolysis yields divicine, an oxy-amino derivative of pyramidine. The sulphate of this base is definitely toxic; .6 milligram per gram bodyweight, when injected subcutaneously into young guinea pigs, produces convulsions lasting for one hour. The *post-mortem* revealed congestion of many organs, especially of the central nervous system. Injections of vicine or vicianin, however, produced no ill effects. Seeds of "akta" fed to ducks cause death, whereas pure "khesári" has no such effect. The symptoms caused by "akta" in ducks are referable to an affection of the nervous system, and include ataxia and paresis. In the case of monkeys fed on diets containing "akta," the symptoms were not so well defined, but they could all be referred to a lesion of the nervous system. In no case were characteristic lesions exhibited in animals fed on "khesári" unless "akta" was also present.

The symptoms observed were not those of typical lathyrism in man, but it is pointed out that the effects of similar agents are frequently different in man from those observed in animals. The parallelism between the results of chemical analysis and those of feeding experiments in this research indicates a path which workers in this field might profitably follow. Evidently the last chapter on lathyrism has not yet been written.

FRANK GARNETT MEMORIAL FUND.

NINTH LIST OF SUBSCRIPTIONS.

	£	s.	d.	£	s.	d.	£	s.	d.
Amount brought forward from eighth list ...							318	10	0
Lancashire V.M.A.:—									
J. T. Allen	2	2	0						
W. L. Cockburn ...	0	10	0						
F. G. Edwards ...	1	1	0						
C. W. Elam ...	0	5	0						
R. P. Holmes ...	0	10	0						
J. Holroyd	1	1	0						
A. W. N. Pillers ...	1	1	0						
J. Spruell	1	1	0						
F. Warburton ...	0	10	0						
J. H. White ...	0	10	0						
T. Wilson	1	1	0						
				9	12	0			
North Midland V.M.A. ...				1	1	0			
North of Scotland V.M.A. ...				5	5	0			
G. Howie				0	10	6			
							16	8	6
							£334	18	6

The Veterinary School at Utrecht, has recently been affiliated with the University, which has now a Veterinary Faculty. Professor Dr. L. de Blieck is the first President, and Professor Schornagel the Secretary.

We congratulate our Dutch colleagues on having taken this important step in the education of the veterinary student.

The Veterinary Record.
26th September, 1925.

THE THERAPEUTIC SUBSTANCES ACT.

The Therapeutic Substances Act, which received the Royal assent on August 7th, is regarded, by the medical profession, as a much needed measure, and its appearance upon the Statute Book is welcomed accordingly. Some months ago, when the provisions of the Act were under consideration, considerable differences of opinion were expressed regarding the desirability of the inclusion of substances intended for veterinary use.

The application of the Act has been restricted. The Joint Committee is empowered to make regulations necessary to exclude substances intended exclusively for veterinary use.

It is difficult for the ordinary mind to understand why a veterinary surgeon should not have the same right as the medical practitioner to expect that preparations of the pituitary gland which he is called upon to employ in the course of his professional duties are sufficiently potent.

Again, it appears to be somewhat anomalous that the potency of a bovine tuberculin which is to be employed for human use must be guaranteed, while no such guarantee is required if the same tuberculin is to be used for the diagnosis of tuberculosis in cattle.

Provision is made for the addition of further preparations to the schedule.

If it should be considered desirable to apply a physiological standard to such substances as ergot, cannabis indica, or digitalis, it would be reasonable for the veterinary practitioner to expect that such substances, supplied to him, should conform to that standard, and not be of unknown value, but marked "For veterinary use only."

It is to be hoped that their interpretation of their powers will enable the Joint Committee to overcome at least some of these anomalies.

A meeting of the eight veterinary inspectors who have been appointed to carry out the provisions of the Tuberculosis (Animal) Order, 1925, and the Milk and Dairies Act, 1915, in the County of Suffolk, was held on September 9th at the Shire Hall, Bury St. Edmunds. Mr. Horace L. Roberts, F.R.C.V.S., of Ipswich, Chairman of the East and West Suffolk Veterinary Inspectors' Association, presided.

The various technical points of the Order and Act were discussed by the members. During the course of the meeting, Mr. Cecil Oakes, clerk to the East and West Suffolk Joint Diseases of Animals Sub-Committee, addressed the gathering, and explained the legal position of the inspectors.

Mr. Oakes' advice was much appreciated, and it was felt his opinions would be very helpful. A hearty vote of thanks was accorded to Mr. Oakes.

DIVISIONAL REPORTS.

North Midland Division.*

The Annual Summer Meeting was held at Sheffield on Friday, July 17th, when the following members, ladies and visitors were present:—The President (Mr. G. Green) and Mrs. Green, Rotherham; Mr. R. E. Glover, Cambridge; Mr. T. and Mrs. Bowett, Worksop; Mr. W. Collinson, Anston; Mr. P. Evershed, Nottingham; Mr. G. J. and Mrs. Furness, Alfreton; Mr. R. and Mrs. Hudson and Mr. Hudson, Junr., Retford; Mr. J. A. Hodgman, Barnsley; Mr. E. and Mrs. Marrison, Bakewell; Mr. and Mrs. Prince, Ashbourne; Mr. M. Robinson, Barnsley; Mr. C. S. Smith, Barnsley; Mr. Wheatcroft, Wentworth, Rotherham; Major and Mrs. Abson, Mr. C. H. Ducksbury, Mr. T. C. Fletcher, Mr. W. G. Jones, Mr. S. H. Nixon, Mr. S. E. Sampson and Mr. Sampson, Junr., Mr. H. and Mrs. Thompson, Mr. J. S. and Miss Lloyd, of Sheffield.

The first part of the meeting was a demonstration of the Intra-dermal Tuberculin Test, carried out by Mr. R. E. Glover, Institute of Animal Pathology, Cambridge. Several cows, two of which were affected with tuberculosis of the udder, were used for demonstration purposes, the animals having received a sensitising dose of tuberculin either two or three days previous to the diagnostic dose, which was given on the day before the demonstration. Control animals had also been injected. Mr. Glover explained the difference between the swellings in the animals reacting to the test and those which were negative and also explained the use of the calipers. He pointed out the signs shown by re-actors to the diagnostic test. Following the demonstration, the two cows with tuberculous udders were slaughtered, each proving to have tuberculosis well developed, but the cow that gave the biggest reaction to the intra-dermal test was the one showing the fewest lesions of tuberculosis in the carcase. The demonstration and *post-mortem* being completed, the party took motor cars and proceeded for a tour into Derbyshire; the places of interest visited being Wyming Brook, Moscar, Lady Bower and Bamford, to the Rising Sun Hotel, Hope, where luncheon was partaken.

Following luncheon, the business meeting of the Division was held. Whilst the meeting was proceeding the ladies were taken on by motor car to Castleton, where an enjoyable hour was spent.

The President, Mr. G. Green, took the chair. The Hon. Secretary apologised for the absence of Messrs. Jones, Murgatroyd and Nixon, who although able to attend the demonstration, were not able to accompany the other members on the tour.

The minutes of the last General Meeting were read by the Hon. Secretary and, on the proposal of Mr. FLETCHER, seconded by Mr. COLLINSON, were signed as a correct record.

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* Received on September 2nd.

The minutes of the Council Meeting held on 12th June were also read and, on the proposal of Mr. THOMPSON, seconded by Mr. HUDSON, were approved, and were signed by the Chairman.

Arising out of the correspondence, it was decided to send the annual donation of £2 2s. to the Victoria Veterinary Benevolent Fund, and to send £1 1s. to the Garnett Memorial Fund. The fees submitted for Veterinary Inspectors by the National Association were considered, and the Hon. Secretary was instructed to duplicate these and send a copy to each member of the Division. With regard to representation on the Council of the N.V.M.A., Mr. GREEN proposed and Mr. BOWETT seconded that the Hon. Secretary be instructed to attend the Council Meetings, and that his railway fare and 15s. per day allowance be paid.

It was decided to support Sir John Moore's resolution *re* the suggested Veterinary Research Council.

The PRESIDENT then proposed that a very hearty vote of thanks be given to Mr. Glover for his demonstration and invited the members present to discuss the test and ask Mr. Glover to clear up any matters on which they were in doubt. In returning thanks, Mr. Glover stated that "old tuberculin" was a six weeks' growth of the tuberculosis bacillus on glycerine broth, afterwards sterilised, reduced to one-tenth of its volume and acid added for preserving. Before being sent out for use, it was again diluted to ten times its volume for hypodermic, sensitising, and diagnostic purposes, the doses being one-tenth c.c., the time between the sensitising and diagnostic doses allowed being an interval of forty-eight hours. If there was no reaction in forty-eight hours the diagnostic dose was given and a positive reaction should be expected within the next twenty-four hours. He stated that the action of "doping" in connection with the intra-dermal test was at present uncertain, but it would probably be reported upon later in the *Veterinary Record*. He considered that the intra-dermal test gave a certain result, but the eye test was uncertain. Weekly tests in different spots of the skin gave, in diseased animals, a regular diagnostic reaction. He was not aware that any definite results had been arrived at in applying the test to horses. He thanked the members present for their vote of thanks and said that it was a pleasure to him to attend the meeting and accompany them on the tour.

Mr. MARRISON proposed that a very hearty vote of thanks be accorded to the President, this was seconded by Mr. FLETCHER, and carried with acclamation.

Following the meeting, the company again took motor cars and proceeded, *via* Grindleford and Hassop, to Bakewell, where tea was provided, the party afterwards returning to Sheffield *via* Rowsley, Chatsworth, Baslow and Owler Bar, Sheffield being reached about 9 p.m. Everyone present agreed that a very enjoyable day had been spent, the weather being everything that could be desired.

J. S. LLOYD,
Hon. Secretary.

North of England Division.

(*Continued from page* 829).

In conclusion, I should like to summarise my findings:—

1. The Congress illustrates concretely the position which the Veterinary Inspector is going to take in controlling the public health, in conjunction with Medical Officers of Health and Sanitary Inspectors.

2. The papers clearly indicate that the different writers are capable of handling the different problems arising out of the Milk and Dairies Act, Meat Regulations, and Tuberculosis Order, with complete satisfaction, not only to themselves, but also to the Ministers concerned with each order.

3. Distinct progress has been made towards the position which Veterinary Inspectors are rightly entitled to occupy. This has only come about because the people who are intimately connected with the prevention of disease have at last realised that nothing can be done without co-operation and collaboration, and further that overlapping and "square pegs in round holes" must be scrapped if efficiency is to be procured, and disease eradicated.

Mr. A. GOFTON then addressed the meeting on two points relating to Tuberculous Mastitis.

ANY OTHER BUSINESS.—Mr. C. ELPHICK nominated, and the PRESIDENT seconded, the following gentlemen for membership of the Association: Messrs. S. C. Binks, Alnmouth; F. S. Whitfield, Sunderland; and W. M. Lyon, Wooler.

At this stage the meeting adjourned to Nether House, where the members were met by Mr. W. A. Doughty, and the demonstration of the Intradermic Tuberculin Test was given by Mr. R. E. GLOVER, who ably deputised for Professor Buxton, the latter gentleman being unavoidably detained in Cambridge.

Three cows were provided, two showing positive reactions and one showing the typical negative reaction to the test.

The members displayed a keen interest in the technique, and reactions, and many questions were put to Mr. Glover, who explained the various points in a clear and concise manner.

Following the demonstration, the company was entertained to tea by Mr. and Mrs. Doughty, in delightful surroundings, and in glorious weather.

Mr. HILL, in moving a vote of thanks to Mr. and Mrs. Doughty for their hospitality, said the Division was still further indebted to its host and hostess for their kindness in accommodating Mr. Glover during his stay in Alnwick.

Mr. PEELE seconded the vote in a few well chosen words.

Mrs. DOUGHTY, who was received with enthusiasm, said it had given her great pleasure to see such a large attendance. It was good to know that one had so many friends in the profession.

The SECRETARY thanked Mr. Glover, on behalf of the Division, for the trouble he had taken to demonstrate, and explain the Intradermal Test. He was

(*Continued at foot of first column next page*)

Common Difficulties in Meat Inspection.

DISCUSSION ON MR. MCALLAN'S R.S.I. CONGRESS PAPER.

Lieut.-Colonel T. DUNLOP YOUNG, O.B.E., M.R.C.V.S., D.V.S.M., London: I have to thank you first for the honour of being asked to open the discussion on Mr. McAllan's paper, and secondly, I have to thank Mr. McAllan for the brief but interesting paper which he has put before us. On the subject of legislation Mr. McAllan says that the veterinary surgeon, at least in Scotland, has been put on a proper basis as regards his connection with meat inspection. I congratulate the veterinary surgeons in Scotland on being placed in the same position as veterinary surgeons all over the world, with the exception of England, but we are not without hope that the recommendation made by the Departmental Committee of the English Ministry of Health, of which the Medical Officer of Health of the City of London who has spoken to-day was a member, will be put into operation. That Committee made a recommendation that the law should be altered bringing the veterinary surgeon into the same category as the medical officer of health and sanitary inspector with regard to meat inspection. Passing on to Mr. McAllan's paper, the first subject he deals with is the difficulties with regard to multiple slaughterhouses. That has always been a difficulty, and I am sure will always be more or less a difficulty. It seems to me the only way of dealing with it would be to adopt a recommendation which has often been made by Alderman Neal, that there should be as many public slaughterhouses as possible, and as few private ones as possible. That is undoubtedly, from the inspector's point of view, the right thing, but there are many scattered districts in which there are slaughterhouses which could not very well be done without. The difficulty is to cope with them from the inspector's point of view. I might briefly say that has been dealt with in Holland in what appears to be a very satisfactory manner, that is to appoint the local veterinary surgeon to take over the inspection of the animals both ante-mortem and post-mortem. There is, therefore, sufficient inspection without large expense. The next subject he deals with is the lack of uniformity and standardisation in meat inspection. I do not think there is very much to be said on that because the regulations which were framed by the Scottish Board of Health were practically adopted *en bloc* by the Departmental Committee of the English Ministry of Health. I would like to ask Mr. McAllan with regard to what is being done regarding the stamping of meat, because it seems to me that that is a very important matter. We all know that the best beef of the world, the beef that brings the highest price in Smithfield market, is said to be Scotch beef, but even if it does come from Mr. McAllan's own town there is no evidence as yet that the meat has been inspected or that it did come from Aberdeen. It seems to me here is an opportunity for the Scotch people to do two things, first, to see that it has a good system of inspection, and, secondly, by putting a stamp on it, show that it is really Scotch beef, because I have seen many carcasses dressed in the Scotch fashion, not only in England, but they come from abroad. With regard to the premises, that is a difficult matter; there are many old slaughterhouses that it would be very difficult to bring up to modern requirements. That is a matter for the medical officer and the sanitary inspector, probably more than for the veterinary surgeon. The next point he talked about was veterinary inspection. Now they have got associated with them medical officers there should be no difficulty, especially about inspection of the meat. The next point that he deals with is emergency slaughter, and this is the greatest trouble that we have with regard to meat inspection. In Smithfield market the carcass that gives us most trouble is the one sent from the country district without any organs, and after the butcher has spent about an hour on it showing how clever he is, and sometimes he attaches a ticket "For Inspection!" So great a trouble did it become at one time that we had to take steps to summon some of those gentlemen to have an interview with the Aldermen of the City of London. Since then the trouble has ceased so far as Smithfield market is concerned, but one naturally asks where are the carcasses going now? The new regulations have come into force, but up to the present time we see very little improvement. Diseased meat still comes into the Smithfield market from districts where apparently there is no inspection, or if there is it is still very inefficient. With regard to meat in the meat markets, in Smithfield market, as Alderman Neal has already stated, about 80 per cent. is imported meat, and the greatest trouble is the inspection of meat which is either in a frozen condition or a semi-frozen condition, that is, chilled. We get a fair amount of diseased glands in imported meat, in spite of the fact, as has already been pointed out in Mr. McAllan's paper, that the quarters of beef may appear to be absolutely sound. That shows the necessity of examination where there is the slightest trace of tuberculosis, and an examination of every organ and every gland of the carcass. I have heard and read with some interest during the last week of new discoveries that have been made with regard to cancer, and one thing of importance I have read is that it has some relation to the disease which has puzzled us for some years, namely, pseudo-leukæmia. That is not an uncommon disease, but what is the cause of it none of us have been able to ascertain. If it is true, as pointed out in Dr. Young's paper, that it is allied to cancer, then we have gone a step further in the elucidation of that disease. Here I might say that, in my opinion, we should never forget as veterinary surgeons we are placed in a position where we can be of considerable benefit to those who are working as research workers, and I would like to pay tribute to members of the medical profession who have stimulated us on many occasions not to go on in the haphazard way of simply saying a thing is unfit for human food but to take a deep interest in the scientific side—(hear, hear)—to have doubtful facts brought in front of those who know better than ourselves, that is to say, the research workers, and get

(*Continued from previous page.*)

sure that Mr. Glover's efforts had been fully appreciated.

Mr. GLOVER made a suitable response, and a very successful meeting terminated.

J. R. RIDER,
Hon. Secretary.

the disease elucidated, and not pass it over as if it was something about which an ordinary inspector, untrained, could say : " That is not fit for human consumption." The word " co-operation " has been passed along here, and I think quite rightly, and I would ask everyone to work hand in hand with the medical profession to bring before those who know better than ourselves, our difficulties, and have these difficulties overcome by thorough scientific investigation and not by haphazard knowledge.

Mr. J. D. WHITEHEAD, F.R.C.V.S., D.V.S.M., Salford : Mr. President and gentlemen, there are only two or three items I want to mention, and one is to appeal to representatives of local authorities and medical officers that they do give adequate staffs. I know of one town near Manchester where there is one veterinary surgeon and a lay inspector endeavouring to carry out the inspection in the abattoir and a large number of private slaughterhouses. I am afraid it is the medical officer who is to blame, but surely I think we ought to have adequate staffs. Another point is the lack of uniformity in inspection. We have had from the Ministry of Health a memo. laying down a standard practically on the lines of the Scottish Departmental Committee, but yet in face of that we have veterinary surgeons and medical officers passing the carcasses of animals affected with foot-and-mouth disease. I daresay it did not do anybody any harm, but meat is either good or diseased. Not long ago I saw the forequarters of beef which had been stripped for tuberculosis, and this had been passed in a Lancashire town, so that I do think it is essential that we should have a standard laid down. When all is said and done it is not a maximum standard, it is a minimum. Mr. McAllan states about carcasses coming into the meat market without any offal being sent with them, and he says such carcasses should be seized, although there is no specific disease noticeable. Well, I can hardly agree with that, but I think pressure should be brought to bear to insist on the offal being sent with the carcase. (Applause.)

Councillor WOOLLEY, Chairman of the Health Committee, Ilkeston : I quite appreciate very many of the difficulties that present themselves in practical meat inspection. Mr. McAllan mentioned private slaughterhouses. I could say a good deal on that point, but I do not think it is necessary this morning. But one point of importance which has been mentioned by other speakers is the question of uniformity of inspection. I think it is time that we had that. What is wanted is real co-operation, and for the person to carry out this inspection he must be qualified to do so. There is a difference between thinking one is qualified and being actually qualified. I have known a case where an inspector has condemned a carcass before he has examined it. You would hardly believe it, but it is a fact. They can go too far. So that you must have a standard of inspection. What I fail to understand is this, why, with the experience at the back of us, we have not had the good common sense to carry on the control. I know that the real stumbling block is the fact that there is no compensation. You may smile at it, but it is a serious problem. A man comes into the market and buys a beast in good faith, and when he goes home and slaughters it he finds it infected in a small degree, so far as he is able to judge. The first thing that occurs to him is : " What will happen if I report this case ? " It has made him very careful in calling in a particular type of inspector. A court case which I have in mind will prove that. There was a case in Chesterfield where an inspector was called in and examined a carcass of beef and passed it as fit for human food. It was sent to Shirebrook and immediately the beef got there the inspector seized it and had it destroyed as unfit. A Magistrate's Order was obtained and a conviction obtained against the man, who was fined £10. He appealed but he lost his case. What I want to say is if that meat was unfit for human food in Shirebrook it was unfit for human food in Chesterfield.

Dr. BUIST : On the question of lack of uniformity of inspection, I do think it quite a serious thing, and how to secure that uniformity seems to me an important point. I shall be very glad to hear recommendations as to how best to secure that end. It seems to me that certain centres of the country could be used, and an organised arrangement made, whereby facilities might be given for inspectors and medical officers of health to get actual demonstrations with the materials before them. A start has been made and a good deal has been done by a medical officer of health for the City of London in this direction, in the way of organised demonstrations at Smithfield Market, and on the days of seizure actually showing the materials going through and the system how best to secure that no carcass goes through that ought to be condemned. These demonstrations have been well attended, and I have heard much gratitude expressed for their initiation. I only mention this as an illustration of what might be extended very largely all over the country.

THE REPLY.

Mr. MCALLAN, in replying to the discussion, said : Mr. President, ladies and gentlemen, I am glad that I have not to say very much in reply. With regard to Lieut.-Colonel Young's remarks, he brought up the stamping of meat. I quite realise the very great importance of this, and the great advantages that stamping of meat would bring about ; it would do away with such things as the Councillor spoke about, of meat passing in one district and being condemned in another, and the man who gets the last bit of the carcass being held responsible, since the stamping of meat would put the onus, for specific disease at any rate, upon the inspector. That, to my mind, is one of the greatest advantages of stamping meat ; and another is it would save such people as Colonel Young inspecting the meat after I have inspected it in Aberdeen. The thing is I have never had any requests from the trade in Aberdeen to institute a system of stamping at all, but I have heard so much about it from my London friends during this Congress that I am determined to take it up when I go back. I was very pleased with Colonel Young's remarks about the question of preservation. Since I took over meat inspection under the new regulations I have been greatly struck with the amount of material that one can get in the slaughterhouse, material which previously was simply destroyed without any regard whatsoever as to its value, and I have been working quite a lot with the people in Aberdeen University in the investigation of things which previously were condemned for

human food without any effort being made to find out what the conditions were. I think we can do a tremendous lot of work there, work that will be valuable to both the medical and veterinary professions. Mr. Whitehead spoke about the inadequate staffs, and I quite agree with him that the difficulties we have had have been largely due to the fact that we could not get a staff in most places sufficiently large to carry out the regulations as they ought to be carried out. But I can see great difficulties over the staffing question, especially with multiple slaughter-houses. I think Mr. Whitehead misunderstood my remarks in one connection. I was talking about meat marts and suggesting that carcasses showing specific disease without offal or viscera for the inspector to see should be destroyed. I am firmly of that opinion. He instaned the case of a pig where a lesion was localised in the head and where one had the chance of examination of the rest of the glands, and said it would be a farce to condemn such a pig. I should not condemn such a pig, but if I got bovines coming in showing evidence of tuberculosis, frequently in the bone, and with no offal to guide me, I cannot see what else I can do but condemn that carcass. Councillor Woolley was asking for uniformity. It may interest you to know that we have a uniform system of inspection in Scotland, and as I point out in my paper that has been of inestimable advantage to inspectors and to traders alike. I should just like here to say a word in praise of the Committee that drew up this uniform system for us. The amount of work that must have been done was absolutely remarkable, and the results are equally remarkable. I think we have two members of that Committee here. With regard to such a case as Councillor Woolley mentioned, I should think the new regulations will, to a great extent, prevent fraudulent delivery, especially now since you have got your rural slaughterhouse regulations to bring in rural districts. Had you not done that I could see tremendous scope for the fraudulent person who would pop over the border and do what he liked. Also the stamping would assist there. Dr. Welsh was speaking about the necessity for uniformity. Of course we have got that in Scotland, and if he would only care to study our system he will find how well it works there. (Applause.)

Alderman NEAL: It is my pleasant duty now to ask you to accord a vote of thanks to our friend, Mr. McAllan, for the introduction of this matter, and it really is a matter of the utmost importance. I should like to draw your attention to the fact that we in the city have to deal with Islington Cattle Market. During the War, as you know, there was meat control, and a given area was located within which all animals intended for human consumption were consigned to Islington for slaughter. The result of that was a revelation to us. I have been a member of the Cattle Market Committee of the Corporation of London for over 32 years now. When all these animals were sent to Islington we found instead of about 200 tons of diseased meat being condemned during the year, if my memory serves me aright, we reached over 1,000 tons, and the figures in pounds, shillings and pence were rather remarable. Now we receive something like £400 a year for diseased meat, but during the period of control we had something like £3,800 as the result of the meat that was condemned in that market. What does that mean? It means this, that there is an enormous number of animals slaughtered within that area which do not come to Islington, but which are slaughtered in the local districts and cut up into joints and sold in these local areas. If ever there was a case of necessity for uniform inspection, surely that proves it. Well now, how are we going to get it? I suppose that our recording secretary, Mr. Hayhurst, gives more instruction in this direction than any other man in Great Britain. He teaches an enormous number of students at Islington, and they, in due course pass to the Royal Sanitary Institute, and they undergo an examination. Well, I do not know whether the local authorities throughout the country insist upon their inspectors having a diploma of the Royal Sanitary Institute or not, but if not then surely it is for the local centres, where their inspectors are examined, to come into line with the Royal Sanitary Institute so as to get, through the means of given examination papers, the issue ultimately of diplomas of efficiency. That leads me once more to the old point which I raised in Newcastle some seven years ago when I said it was utterly impossible, unless the animal intended for human consumption received an ante-mortem examination as well as a post-mortem examination, that we could be thoroughly satisfied that that particular carcass was suitable for human consumption, and there I received—and I was very gratified at receiving it—the unanimous support of the Newcastle Conference, since which time that has been confirmed in various places: Hull, Folkestone, Liverpool and elsewhere. And that leads on to this, that wherever it can be done we should substitute for the private slaughterhouse a public abattoir. It is easily seen that wherever we could establish public abattoirs in place of private slaughterhouses we could get the ante-mortem as well as the post-mortem examination. It is very difficult, of course, in the country districts because of the distance that they lie from the centre where the work is carried on, but I do think that we should endeavour as far as is possible to press forward the necessity of the ante-mortem and post-mortem examination. Now, the only other point is the desirability of stamping meat. Surely we must all be in agreement that we want to secure for English production the priority to which it is entitled in regard to the sale of meat, and how can you do that unless you have stamping the meat with an official stamp? Aberdeen we have heard of more than once during yesterday and to-day, and I think we all acknowledge that the very finest beef of the world comes from the county of Aberdeen. Now, it seems to me greatly to their interest to assist in arranging for the stamping of meat, and if we do that, and if we press that forward in the great markets of the country, we shall very soon find that the consumers of the country will look for the stamp on the meat and say that that is the class of meat they require. If we do that we shall surely be helping the British farmer and British agriculturist, and it is by helping British agriculture, which after all is the backbone of the whole country, that we shall eventually solve some of the most difficult problems we have to face. Mr. McAllan has done us a service in giving us this paper, and I want you to join with me in conveying to him our thanks for the careful manner in which he has drawn up the paper which we have just been discussing. (Applause.)

Mr. MCKINNA: I beg to second that motion. (Applause.)

Glasgow Veterinary College.

Professor Glaister's Statement.

Professor Glaister, chairman of the Governors of Glasgow Veterinary College, in a statement regarding the position of the College, says :—It will be in the recollection of those interested that the Scottish Board of Agriculture and the Secretary for Scotland determined that no further grants from public money were to be given to the Veterinary College in Glasgow. Although the Governors of the Glasgow College did their best to convert the Scottish Board and the Secretary for Scotland to the *status quo*, it became clear from the pronouncement of the Scottish Secretary that the Scottish Board and himself were not to be changed from the position they had taken up.

Notwithstanding this resolve, however, the Governors of the Glasgow College did not agree to this serious proposal, and for various reasons.

The public meeting held in the city, and attended by many representatives of important public bodies, passed a resolution pledging itself to maintain the College as a teaching institution, on the ground that the Glasgow College, during the sixty odd years it had been exercising this function, had amply fulfilled the objects of its promoters. During these many years the College had sent forth graduates who had attained important positions in the veterinary world, even the very highest in their profession. Moreover, the Governors believe that Glasgow is an unrivalled centre for veterinary teaching and research work, inasmuch as it is the centre of large agrarian areas devoted to cattle rearing, sheep-raising, horse-breeding, and milk production, and is, in addition, the port of arrival of large consignments of live stock and dead meat from foreign and other ports.

Glasgow's Advantages.

The areas served by the Glasgow College contains one-half the entire population of Scotland, one-fifth of the whole area of Scotland, embracing a live stock of 2,500,000 sheep, 400,000 head of cattle, 450,000 horses, not to speak of pigs, dogs, etc. On these grounds alone Glasgow is unrivalled as a centre for veterinary teaching.

Another advantage is that students from Glasgow and its wide neighbourhood are able for the most part to travel daily to their homes, who, if unable to do so, would require to abandon a professional career.

Should the concentration of veterinary teaching in Edinburgh ever become an established fact, it would mean, as said above, that many veterinary students and their relatives would be unable to provide the necessary funds to enable them to live and study so far away from home, since the greater item of cost in the career of the student is his board and lodging while from home. While it is quite true that Educational Authorities have the power to give grants to veterinary students during their period of tuition, it is hardly likely that they would be able to provide the much larger sums which a residence in Edinburgh would entail.

The numbers of students attending the College since the war have increased. Numbering between ninety and 100, they have made excellent showing in the examinations which, for all veterinary colleges in the United Kingdom, are conducted by one independent Board of Examiners appointed by the Royal College of Veterinary Surgeons by virtue of powers conferred on the College by the Act of Parliament establishing that College.

Students' Successes.

Even in the last examination so conducted in July of this year, the students of the Glasgow College have come through the ordeals of examination most creditably. Of the forty-five students from the College who presented themselves in all four examinations, 73 per cent. passed, and 27 per cent. failed to pass. Comparing these results with those of the other veterinary colleges the following is the result, viz. : London and Liverpool had a percentage pass of 64 and failures 36 ; Edinburgh a percentage pass of 66 and failures 34 ; Dublin, 61 per cent. passes and 39 per cent. failures to pass ; and the four schools combined (excepting Glasgow) showed 64 per cent. passes and 36 per cent. failures. Moreover, in respect of honours gained in these examinations, the Glasgow College students came out over 13 per cent. ahead of its nearest competitor. Such results as these do not indicate any deficiency on the part of the teaching nor the want of application to their studies on the part of the students themselves. Glasgow students have the great advantage of exceptionally good clinical training, which is an all-important element in teaching.

It is quite true, speaking generally, that the teaching staff of the Glasgow College are poorly remunerated in comparison with the staff of the Royal (Dick) Veterinary College in Edinburgh, but it is to be remembered that the remuneration of the teachers in the latter College is largely assisted from public money administered through the Scottish Board of Agriculture. But while, so far as remuneration is concerned, the Glasgow staff is but relatively less well paid, they are all of them enthusiastic and able teachers, and are highly respected in their profession.

Research Work.

With regard to research into diseases of animals, it ought not to be forgotten that the movement which culminated in the formation for Scotland of an association for research in diseases of animals originated and was for some time carried on exclusively in the Glasgow College with regard to certain diseases of sheep. It is not without some significance, moreover, that when the above association was formed they chose for their chief investigator the then Principal of the College, Mr. Gaiger, and his then assistant, Mr. Dalling.

Many people suppose that the main work of the veterinary profession is the treatment and cure of diseased animals. While that is largely true, there are other aspects of the work of the veterinary practitioner which are of a protective and preventive character in relation to the public health. Rabies, for example, has been exterminated, anthrax has been controlled, glanders of horses and equine animals has been prevented, and men's lives, therefore, protected. In the new Act, which comes into force in September, county authorities will have to tackle the subject of tuberculosis in milk-giving animals, and they will have to look to the members of the veterinary profession for guidance. Moreover, the veterinary

practitioner stands between the public and the sending out from abattoirs for human consumption the carcasses of animals which are diseased or have died from illnesses. The comparatively recent outbreaks of foot-and-mouth disease remind us that the veterinary practitioner has much to do with their suppression.

To him, also, must we look for the salvage of the lives of sheep from such diseases as braxy and others, and from diseases of cattle.

For those reasons, the Governors of the Glasgow College have resolved, with the assistance of the public-spirited citizens of Glasgow and the West of Scotland, to continue the Glasgow College as a teaching and research institution, independent of grants from public funds in the meantime. They look confidently to those citizens for such assistance as will enable them to do this, in the belief that Glasgow and the West will not willingly allow an institution to be suppressed which, for sixty odd years, has been fulfilling a useful purpose in its midst.

Assurance of Support.

The Governors already have received assurance of support. Promises of donations of large sums have been given. Lord Woolavington has kindly promised £2,000, two other kind donors, whose names will be announced later, £1,000 each, and some others £500 each.

In the immediate future the Governors will issue their appeal to the public—an appeal, it may be added, which was prevented from being issued five years ago owing to the uncertain attitude of the Scottish Board of Agriculture. The sum aimed at is £30,000, with which the Governors hope to be able to make the Glasgow College independent and to make it second to none in the United Kingdom. They have in mind the inadequate remuneration of the teaching staff, and they expect to be able, in some measure, at least, to improve this.

In the past several County Councils, Education Authorities and others have annually contributed towards the assistance of the College, and some of these already intimated increases in their grants.

The public may be assured that the Governors will spare no effort to maintain the high efficiency of the College in respect of its teaching, and to make the College effective for that purpose. Adequate buildings belong to the Governors in Buccleuch Street, which are capable of extension, and improvement according to plans which were prepared several years ago when the original appeal to the public was proposed.

It is for the citizens of Glasgow and the West of Scotland now to say whether the Glasgow Veterinary College shall continue to flourish, and whether they will feel satisfied if the College were suppressed and its students compelled to go to Edinburgh for tuition. With their help, the Governors look forward to a continuance of a long period of usefulness to the West of Scotland of the Glasgow Veterinary College.—*The Scotsman.*

The first outbreak of anthrax for many years has occurred at Ludworth, Cheshire, and has caused considerable alarm among farmers, who are taking precautions to safeguard their stocks.

Royal (Dick) Veterinary College Contingent, O. T. C.

Summer Camp, July, 1925.

The Royal (Dick) Veterinary College Contingent, under the command of Captain Wm. M. Mitchell, M.C., spent a very enjoyable fortnight under canvas this year at Dreghorn Castle, near Edinburgh, from July 15th to 30th. The camp was considered the best in all respects of those held since the War. The weather, a great factor in camp-life, could hardly have been improved upon, the result being that the pre-arranged scheme of training was carried through uninterrupted by the unwelcome attentions of "Jupiter Pluvius."

The camp was by no means what is known as a "rest camp." On the contrary, owing to the relatively short period at its disposal, the Contingent had to be put through a very intensive course of training in order to attain the high standard of efficiency at which it aims. Every man was mounted while in camp, horses being supplied this year by the 18th Field Brigade, R.A., and for training purposes the Contingent was, as in the last four years, organised in three Skeleton Troops. Included in the course of mounted training were the fundamentals of section and troop drill, while this year, for the first time, squadron drill was attempted with satisfactory results. In addition, dismounted drill was carried out, which together with a thorough course of small-arm drill and on the theoretical side, a short course of lectures in map reading, stable management, etc., completed the programme of instruction. This year the N.C.O.'s, under the supervision of the Officers and the Sergeant-Major Instructor, were entrusted with the task of making their respective troops efficient in all branches of military training mentioned. The object of this procedure was to accustom the N.C.O.'s to assume the responsibility of instructing and commanding men, thus fulfilling the "raison d'être" of the O.T.C., which is to turn out men suitable for commissioned rank. That the N.C.O.'s fully justified the confidence placed in them by their Officers, was fully borne out on Inspection Day, and was reflected in the very encouraging report made by the Inspecting Officer, Lieut-Col. J. J. Aitken, C.M.G., D.S.O., O.B.E., R.A.V.C.

The camp did not consist entirely of "hard labour," and Sports Day, which being graced by a large number of lady guests, has always been the social day of the camp, was notable for the zest with which the cadets entered into the various inter-troop contests. In a long and varied programme, the individual and half section jumping were outstanding in point of interest and merit. Cadet Boyd, in the former, and Sergeant Brook and Cadet D. F. MacPherson, in the latter, were the successful competitors out of a large "field."

At the conclusion of the inspection the Contingent rode to the village of Temple, at the foot of the Moorfoot Hills, where in the evening the Cadets provided a concert in the U.F. Church Hall. The inhabitants of Temple turned out in large numbers, the Hall being taxed to its limit, and the audience showed hearty appreciation of the individual and collective efforts which were presented to

them. (See extract from local press below). Thanks to the courtesy of Mr, Pringle, Temple Farm was placed at the disposal of the troops and their horses for the night. Although ample sleeping accomodation was provided, many of the Cadets slept in the open, the night being fine, and an unlimited supply of straw being at their disposal. The return ride was prolonged by a wide detour through some very fine country. Towards its close the Pentland Hills were crossed and after a long day's ride the Contingent reached Dreghorn somewhat weary, but delighted with the experiences of a very enjoyable two-days' route march.

CADET CORP. A. G. RALSTON.

* * * *

The following are the results of an open competition, held at Aberdeen :—

ABERDEEN, ABERDEENSHIRE, AND KINCARDINESHIRE TERRITORIAL RIFLE ASSOCIATION.

WAPINSCHAW, AUGUST 5th, 6th and 7th, 1925.

Open to all members of any Officers' Training Corps (excluding Permanent Staff).

Officers' Training Corps—Competition.
5 shots at 200 yards target—Small 4ft.
Possible, 25.

RESULT.	Score.
First.—Corpl. J. N. Ritchie, M.R.C.V.S., Royal (Dick) Veterinary College Contingent, Officers' Training Corps	25
Second.—Aberdeen University O.T.C.	24
Third.—Aberdeen University O.T.C. ... ... Sergt. G. B. Brook, Royal (Dick) Veterinary College Contingent, Officers Training Corps	19

1*st Prize.*—Lord Aberdeen's Challenge Cup (winner to hold for one year) and a Greenheart Trout Fishing Rod presented by Alex. Martin, Gunmaker; 2nd, 3rd and 4th Prizes in kind.

* * * * *

The following appeared in a recent issue of the *Dalkeith Advertiser* :

"The Royal (Dick) Veterinary College Officers' Training Corps, now in camp at Dreghorn, under the command of Captain Mitchell, arrived at Temple Farm on Monday evening and remained there for the night. The United Free Church Hall was placed at their disposal, and a most enjoyable sing-song was held in the presence of a crowded audience, which greatly enjoyed what to most of them was a novel entertainment. Besides many rousing choruses sung by the whole contingent, solos were contributed by Sgt.-Major Elliot, Sergt. Brook, Corpl. J. N. Ritchie, and Cadet Ross. Violin solos were played by Cadet Harcourt and Corpls. Ralston and J. N. Ritchie entertained the company with their recitations. The accompanists were Corpl. J. Ritchie and Cadet Strachan, who kept choruses going in the intervals between the various items. The concert lasted more than two hours. At the close, Capt. Mitchell, C.O., made a brief and humorous speech, thanking Mr. Pringle for the privilege of camping at Temple Farm, and acknowledging the hearty welcome given them that evening. Dr. Coutts replied. He said it had been a great pleasure to them all to have Capt Mitchell and his men with them, and while the sing-song had recalled other days to some of them when they took part in such entertainments themselves, it gave an excellent idea to others of what a soldiers' sing-song was, and of how our men, during the great war, kept themselves cheerful because they knew how to entertain themselves. The concert concluded about 10-30 with the singing of the National Anthem."

Scrapie in Sheep.

SIR STEWART STOCKMAN'S STATEMENT.

The Special Advisory Committee of the Animal Diseases Research Association, represented by Mr. Falconer L. Wallace (in the chair), Sir Stewart Stockman, Professor Lorrain Smith, and Dr. Bradley, with Professor Gaiger attending, have issued a report of the conference with a deputation from the National Farmers' Union of Scotland, to discuss the possibilities of action, through (a) intensified research, and (b) the setting up of a voluntary scheme under which the Ministry could, on application by a flockmaster, grant a certificate of cleanness in respect of scrapie in so far as that was practicable in the present state of knowledge of the disease. The members of the deputation asked Sir Stewart Stockman's views upon the issue by the Ministry of Agriculture of a certificate to clean flocks (there being precedents in the case of stallions, potatoes, milk), so constituting a "white list," any such scheme to be voluntary on the farmer.

Sir Stewart Stockman gave a short history of the disease which a hundred years ago was found all over England. Now it had disappeared from England, with the exception of Northumberland, and was found almost entirely in counties on both sides of the Border, where it had spread from farm to farm locally without going far from this district, except in a few cases, and had not established itself outside. He believed from that history it should be possible to get rid of it from its last strongholds from which it had not spread for 100 years. He said he had been investigating the disease for 12 years, and desired to point out that such a disease with an incubation period (so called) of from two to four years could not be submitted to intensive research in the ordinary sense. Sir Stewart emphasised the difficulties of the proposal to grant certificates to clean flocks. A farmer might have scrapie and not know it for a few years; the disease might miss a generation; he even knew of cases of ewes dropping one lamb clean and the next lamb "scrapie." The man who did not wish the certificate instituted would say that there was such uncertainty about the disease that one could not say who had it and who was clear. They had to consider what a certificate would be worth after what he had told them, and they would have to rely on the farmers' own statement.

Mr. Reid, Montrose, suggested that the certificate might be renewable each year, and that it would be voluntary upon the farmer whether he applied for one or not. They made the suggestion for Sir Stewart's consideration.

Professor Gaiger stated that in his experience there was hardly a farm on the Borders that was not affected or had not at some time had the disease, and, that being so, only a very few could apply for the certificate.

It was ultimately decided that the deputation should discuss the whole matter at a full meeting of the executive of the National Farmers' Union of Scotland, and the National Farmers' Union of Scotland might then decide to draw up and submit to Sir Stewart Stockman a proposal which would meet their views as to what action was necessary, which he would lay before the Ministry.

SIZE AND FUNCTION IN ANIMALS.

Dr. John Haldane, of Oxford, opened a discussion in which zoologists and physiologists joined, at the recent British Association meeting at Southampton, on the extent to which size governs the functions of animals. He gave many amusing examples and showed that a scientific thesis, even with a very serious basis, need not be dull. A number of mechanical results of size were indicated by such matters as the difference in the girth of the legs of an elephant and a mosquito. In the case of blood pressure the strain on the capillaries in the foot of a giraffe standing erect must be such as would sqeeze the blood out through the skin of a man. If a mouse fell down a mine shaft 1,500 ft. deep, the resistance of its surface as compared with its weight was

such that it landed with only a slight bump and ran off contentedly. In the same circumstances, a rat would break all the bones in its body and a man or a horse would "splash."

The muscular metabolism increased in proportion to the size of an animal, but the surfaces increased at a much lower ratio. The skin surface might be compensated by wrinkles or additional sweat glands, and there was little difficulty in increasing the working power of the lungs and kidneys without an impossible increase in bulk. In the case of the digestive tract, however, there were equal difficulties in increasing the surface and in accelerating the rate at which the food passed through. A mouse had to eat half its own weight in a day, but had no difficulty in getting rid of the excess of heat caused by muscular activity. The case of a very large creature like a whale presented great difficulties, especially as its skin was not adapted to the passage of heat. Possibly the habit of whalebone whales of swimming with their mouths open, enabled them to get rid of their surplus heat.

Dr. Chalmers Mitchell pointed out that, although size might set limiting conditions to the possibilities of any particular type of structure, it was unsafe to set it down as the decisive factor. Baby elephants or giraffes were perfectly good animals, able to respire, excrete, feed, and run about very soon after their birth. Even if there were no wider differences in the size to which a type could attain than between a baby and an adult elephant, it seemed clear that mere size could not be the determining factor in function.

Dr. J. Wyman dealt in detail with some of the engineering features in animal structure, and Professor Boycott showed from pathological examples that differences in size beyond certain limits for each type were liable to be associated with disease.

Hackney Stud Book.

A correspondent writes to the *Times*:—

"The 37th volume of the Hackney Horse Society's Stud Book has just been issued and affords interesting reading. The history of a couple of years of breeding is contained in its pages, and though that history does not show Hackney breeding to be in as properous a position as could be wished, it is clear that the case is not so bad as some people allege. The number of fresh stallions entered is 315, or 101 less than in the 36th volume. The mares entered number 444, against 605. In the gelding section the number entered is 136, against 164. The decrease in entries is no doubt due in a certain measure to a somewhat restricted trade. The great expense of showing, and especially Hackneys in harness, has probably had its effect, and owners get into the habit of not entering their horses until they have sold them, or are on the point of doing to.

"The membership of the society also shows a decline, though hardly a serious one. There are now 41 life governors, 470 life members, four annual governors, and 905 annual members, making a total membership of 1,420. Three years ago the numbers were 48 life governors, 498 life members, six annual governors, and 984 annual members, a total of 1,536, or 116 more than at present. There is really nothing to justify a gloomy outlook. There are plenty of good mares and good horses to keep the breed going if the best use is made of them. Frequently special circumstances, which are difficult to ascertain with any degree of certainty, have an effect on the registration of horses. When trade is slack some breeders neglect to register their stock, unless it is very good.

"Yorkshire is still at the head of the counties in which prizewinners were bred. Last year is the eighth in succession that this county has occupied that position. The total of Yorkshire prizewinners is 77. Second on the list is Lancashire with a total of 24, and Surrey and Norfolk follow with a total of 23 each. The leading sires of last show season were Mathias with a total of 33, Angram Majesty with a total of 20, Southworth Swell with a total of 19, and Fusee with a total of 18. Taking the total honours of each horse's stock for the last eight years Mathias comes out well at the head with a total of 273. King's Proctor is next with a total of 107, Fusee with a total of 98, Southworth Swell with a total of 89, and Angram Majesty with a total of 77. From the results of the veterinary examinations at the show of 1924 it appears that of the 280 horses examined at Doncaster last year 277 passed, and of those rejected one was sent down because his shoes were overweight. From 1890 to 1924 inclusive 11,183 horses were examined, and of these 10,735 passed, a very creditable record."

NOTES AND NEWS.

The Editor will be glad to receive items of professional interest in these columns.

Diary of Events.

Sept. 30th.—N.V.M.A. Meeting of Council, 10 Red Lion Square, W.C.
Oct. 1st.—R.C.V.S. Committee Meetings.
" 2nd.—R.C.V.S. Meetings of Council and Committees.
" 8th.—Central Veterinary Society. Annual General Meeting.
" 19th.—Opening Ceremony, Royal (Dick) Veterinary College, Edinburgh.
Nov. 30th.—Notification of changes of address to Registrar, R.C.V.S.
Dec. 1st.—R.C.V.S., Examination Fees (December Exams.) payable.
" 8th.—R.C.V.S., Written Examination.
" 10th.—R.C.V.S., Oral Examinations commence.

The Minister of Agriculture has issued an Order the effect of which is to withdraw as from to-day all general restrictions imposed by the Ministry in connection with the outbreaks of foot-and-mouth disease which occurred in the County of Southampton on August 1, 2 and 17. There are now no general restrictions in regard to foot-and-mouth disease in force in any part of Great Britain.

Since Jannary 1 last, 25 outbreaks have occurred in 11 counties, involving the slaughter of 865 cattle, 568 sheep, and 612 pigs, and an estimated payment of £32,561 in compensation.

Tuberculosis in Cattle.

Spahlinger Treatment to be Tested.

In order to make a thorough test of the Spahlinger treatment for bovine tuberculosis, a committee has been formed, of which the chairman is Commander James Bayley, of Woolleston Hall, Nantwich, who is a large landowner and possesses a fine herd of pedigree cattle. This committee comprises medical and veterinary experts and members of Parliament, and its composition indicates the keen interest which is taken in the problem. Among the members are Mr. J. Q. Lamb, M.P., who is secretary of the Agricultural Committee of the House of Commons, and Mr. E. Craig, M.P., the member for Crewe. Colonel C. W. Lyon, who is chairman of the Cheshire Chamber of Agriculture, will represent that body, and the Royal College of Veterinary Surgeons has nominated the principal, Sir John M'Fadyean, to be a member. Mr. Harry German,

the vice-chairman of the National Farmers' Union, is a member, and the Royal Agricultural Society and the Breeders' Society have also appointed representatives. Several local veterinary surgeons will be members of the Committee, and the medical profession will be represented. The Committee has invited the Ministry of Agriculture to send a representative to their meetings, and also to be represented at the tests, and Major James, the divisional inspector for the Cheshire area, has been nominated to attend as the representative of the Ministry.

The object of the formation of the committee is to make an authoritative test of Spahlinger's method of immunising cattle against tuberculosis. Nine years ago Dr. Sphalinger immunised a number of Holstein cattle at Geneva. Several of these are still alive to-day, and the claim is made that they are still immune. This claim cannot be accepted as a scientific fact, because they have not been under the observation of independent persons. Dr. Spahlinger is now busy preparing the vaccine with which a number of calves will be vaccinated. This test will probably take place in October, and the whole operation will be observed by a technical sub-committee appointed by the committee. Such a test carried out in these conditions will be accepted as unquestionable evidence. At a later date the calves will be inoculated with living bovine tubercular germs with the object of ascertaining whether they will contract tuberculosis or not. At a later date afterwards the calves will be slaughtered and examined to see whether they were affected by the tubercular germs. At the same time a number of other calves, which have not been vaccinated, will be inoculated with tubercular germs. It is expected that in the spring a further experiment on a more elaborate scale will be made.

The names of the members of the Committee are as follows :—

Ex. Commander J. Bayley, R.N., Chairman.
Mr. Ernest Craig, M.P.
Councillor J. Cumming, Mayor of Crewe, Hon. Treasurer.
Mr. A. B. Gallagher, of New Zealand.
Mr. H. German, Chairman of the Livestock Committee of The National Farmers' Union.
Ex. Mr. T. C. Goodwin, J.P., C.C.
Ex. Dr. W. H. Grace (Bacteriologist), Pathological Department, Royal Infirmary, Chester.
Ex. Mr. W. H. Hobson.
Mr. J. H. Hughes.
Mr. F. Hobday, C.M.G., F.R.C.V.S., F.R.S.E.
Mr. Pryce E. Hughes.
Dr. H. B. Jeffs, Adviser to the Canadian Government, London.
Mr. J. Q. Lamb, M.P., Secretary of the non-Party Parliamentary Agricultural Committee.
Mr. R. Goulburn Lovell, A.R.I.B.A., of Geneva.
Ex. Lt.-Col. Charles Lyon, Chairman of the Cheshire Chamber of Agriculture.
Mr. James Mackintosh, Principal of the National Institute for Research in Dairying, Reading.
Sir J. M'Fadyean, M.B., B.Sc., LL.D., M.R.C.V.S., Principal of the Royal Veterinary College.
Ex. Mr. J. Manuel, M.B., Ch.B.
Ex. Mr. Peter Manuel, M.R.C.V.S.
Mr. R. G. Patterson, Central Chamber of Agriculture.
Ex. Mr. J. Sadler, Secretary of the Cheshire Chamber of Agriculture.
Mr. Henry Tollemache.
Ex. Major C. W. Tomkinson.
Ex. Dr. R. T. Turner.
Dr. T. Watts, M.P.
Dr. J. H. Williams, M.P.
Ex. Mr. T. Wilson, M.R.C.V.S.
Ex. Dr. Meredith Young, D.P.H., Medical Officer of Health for the County of Cheshire.
Lieut.-Col. W. T. R. Houldsworth, President Ayrshire Cattle Herd Book Society.
Mr. W. B. Mercer, M.C., B.Sc., Principal Cheshire School of Agriculture, Nantwich.
C. W. Arnett (Secretary), 24 Lexham Gardens, London, S.W.

Note.—" Ex " denotes Member of the Executive Committee.

A Curative Serum for Syphilis from the Llama.

" The llama, which is used as a beast of burden in South America, is known generally outside its country of origin only as a zoological curiosity. Great scientific interest, however, has recently been directed towards this animal, which alone among the domestic animals has been found to be a carrier of syphilis. MM. Jauregui and Lancelotti of Buenos Aires have recently been able to show that the organism in the llama is identical with the treponema of man. Female llamas have been successfully infected from a human sore ; while a laboratory accident showed that the llama spirochæte was virulent for man. Syphilis has been endemic in Peru since the days of the Incas, in prehistoric times. A question of great historical interest is thus raised. Was man the infector of the llama, or was he infected by that animal ? The disease in the llama is etiologically and pathologically analogous with human syphilis, but the course is in general shorter. The llama shows all the symptoms that man does, including the cerebral ; but the tertiary period usually occurs in about two or three years after the original inoculation. A point of more than academic importance, however, is the discovery of a curative serum for the llama. An animal is given ten to fifteen inoculations with an attenuated culture. The resulting serum has been injected into syphilitic llamas, and has beyond doubt cured them. Animals treated on the appearance of the primary lesions have lived for three to ten years, while the controls have all died from general paralysis in less than three years. In the treated animals the biological reaction remained negative, and their progeny showed no taint of the disease. Remarkable results have also been obtained in the secondary phase. The use of the serum in man has produced results more rapidly favourable than those which have been obtained with the usual chemotherapeutic methods ; the serum, moreover, is absolutely harmless. It is too early yet to say how permanent are the results in man and that an absolute cure is obtained ; that is a matter for years of experimentation and clinical observation, as Dr. Jeanselme pointed out to the Académie de Médecine on March 10th (see Journal, March 28th, p. 628). Llamas are now being obtained by the Pasteur Institute for these investigations." — *British Medical Journal.*

The Editor begs to acknowledge the receipt of the following :—
Communications from Messrs. F. T. G. Hobday, R. Barrons Nelder, J. F. D. Tutt and A. M. F. Cole.

National Veterinary Medical Association of Great Britain and Ireland.
EDITORIAL OFFICE : 10 Gray's Inn Square, London W.C.1.
Cheques should be made payable and all communications sent to the General Secretary at the Offices of the Association, 10 Gray's Inn Square, London, W.C.1.